

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re:	Robert L. Payer, <i>et al.</i>	Confirmation No:	4417
Serial No:	09/885,226	Group:	2839
Filed:	June 20, 2001	Examiner:	Hyeon, Hae M..
For:	Solid-Phase Welded Optical Element Attach Process		
Customer No.:	29127		
Attorney Docket No.	1065us		

APPELLANTS' BRIEF

Assistant Commissioner for Patents

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Sir:

This is the Applicants' reinstated appeal from the Office Action, mailed April 7, 2005. It is also responsive to the Notification of Non-Compliant Brief of September 25, 2007.

A new Notice of Appeal accompanies this Brief pursuant to MPEP 1204.01 to reinstate the appeal.

MPEP 1204.01 provides that previously paid fees are applied to the new Appeal. Differences exist due to fee increases, however. There is a difference of \$90.00 between the originally paid fee for the Notice of Appeal (\$160.00) and the current fee (\$250.00). Also, there is a difference of \$85.00 between the originally paid fee for the Filing of the Brief (\$165.00) and the current fee (\$250.00). These fees are submitted herewith.

Real Party of Interest

Axsun Technologies, Inc. is the real party in interest.

Related Appeals and Interferences

There are no related appeals or interferences.

Status of Claims

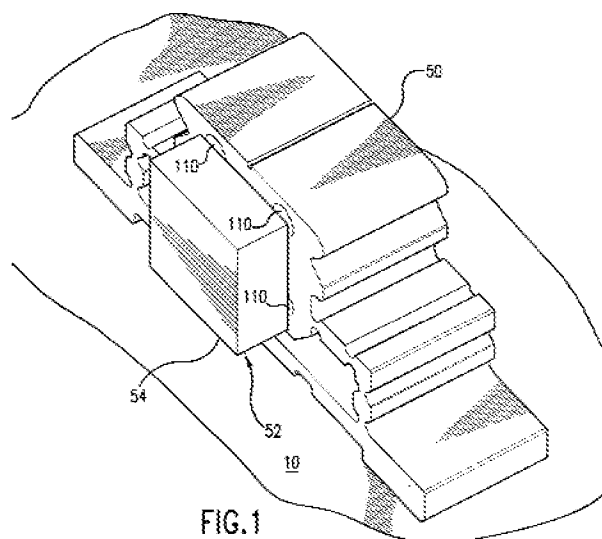
Claims 1-34 are pending in this application. Claims 27-34 are withdrawn from consideration. Claims 1-26 stand finally rejected pursuant to the outstanding Office Action. Claims 1-26 are on appeal.

Status of Amendments

All amendments have been entered. There were no post final amendments or proposed amendments.

Summary of Claimed Subject Matter

The present invention of claim 1 is directed to a micro-optical component, as shown in Fig. 1, for example:



This component includes an optical element 52, as provided in the first clause of claims 1, 6, 7 14, 19, and 20, such as a lens substrate in which a lens is formed, as provided in claim 5. See specification at page 5, lines 8-9. A mounting structure 50 is used to attach this optical element to an optical bench 10 as provided in the second clause of claims 1, 6, 7 and the second and third clauses of claims 14, 19, and 20. See specification at page 6, lines 6-7.

According to the invention, the optical element is solid phase welded to the mounting structure as provided in the third clause of claims 1, 6, and 7 and the second clause of claims 14, 19, and 20 and reference 110 of Fig. 1. See specification at page 5, lines 8-9. In the preferred embodiment, the element 52 is thermo-compression welded to the mounting structure 50 as provided in claim 2. See specification at page 7, line 19-20.

As provided in the third clauses of claims 14, 19, and 20, the mounting structure is solder bonded to the bench. See reference 120 of Fig. 5 and the specification at page 7, line 12.

Grounds of Rejection to be Reviewed on Appeal

Whether claims 1 and 2 are anticipated under 35 U.S.C. § 102(b) by U.S. Pat. No. 5,841,544 to Dautartas, *et al.* (Dautartas patent).

Whether claims 14, 15, 18, and 19-23 are unpatentable under 35 U.S.C. § 103(a) over the Dautartas patent in view of WO 91/06022 and the Aksyuk application EP0 961 150 A2.

Argument

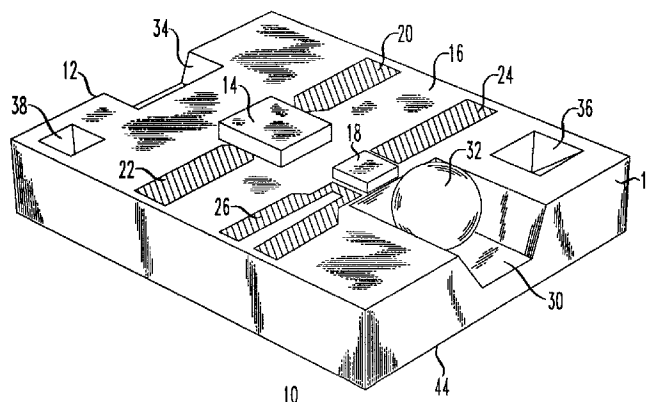
Arguments relating to whether claims 1 and 2 are anticipated under 35 U.S.C. § 102(b) by the Dautartas patent:

Applicants respectfully believe that claims 1 and 2 are not anticipated by the Dautartas patent.

Claim 1 is directed to the combination of an optical element and a mounting structure. The mounting structure attaches the optical element to an optical bench.

This claimed structure is not shown in the Dautartas patent. The Dautartas Fig. 1, for example, shows a ball lens 32 being solid phase welded directly to an optical bench 12 or platform.

FIG. 1



The Dautartas patent does not show or suggest the solid phase welding of the optical element to an optical bench via a mounting structure, as claimed.

Thus there can be no anticipation.

Arguments relating to whether claims 14, 15, 18, and 19-23 are unpatentable under 35 U.S.C. § 103(a) over the Dautartas patent in view of WO 91/06022 and the Aksyuk application:

Applicants respectfully believe that claim 14 would not be obvious in view of the Dautartas patent, WO 91/06022 and the Aksyuk application. Specifically, claim 14 requires an optical element, such as a lens, a mounting structure to which the optical element is solid-phase welded. The mounting structure is then solder bonded to an optical bench.

Again, the system disclosed by Dautartas patent does not include a mounting structure.

Moreover, the secondary references do not teach the combination of the solid phase welding of an optical element to a mounting structure and solder bonding of the mounting structure to the bench.

The relevance of this invention arises from the fact that the solid phase welding can form a very robust joint against the temperature cycling associated with the solder

bonding of the mounting structure to the optical bench. Thus, the optical element can be attached to the mounting structure, and then the mounting structure subsequently solder bonded to the bench while avoiding the optical element detaching from the mounting structure, since the solid phase welded joint is robust against the temperatures encountered during the solder reflow.

None of the reference appreciates this problem nor would make the invention obvious to one skilled in the art.

For the foregoing reasons, Applicants believe that the pending rejections should be withdrawn, and that the present application should be passed to issue. Should any questions arise, please contact the undersigned.

Respectfully submitted,

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Claims Appendix

1. (previously amended) A micro-optical component, comprising:
an optical element, including a lens, for interacting with an optical beam; and
a mounting structure for attaching the optical element to an optical bench;
wherein the optical element is solid-phase welded to the mounting structure.
2. (original) A micro-optical component as claimed in claim 1, wherein the optical element is thermocompression bonded to the mounting structure.
3. (original) A micro-optical component as claimed in claim 1, wherein the optical element is thermosonically bonded to the mounting structure.
4. (original) A micro-optical component as claimed in claim 1, wherein the optical element is ultrasonically welded to the mounting structure.
5. (original) A micro-optical component as claimed in claim 1, wherein the optical element comprises a lens substrate.
6. (previously amended) A micro-optical component, comprising:
an optical element for interacting with an optical beam; and
a mounting structure for attaching the optical element to an optical bench;
wherein the optical element is solid-phase welded to the mounting structure
and wherein the optical element comprises a microelectromechanical device.
7. (previously amended) A micro-optical component, comprising:
an optical element for interacting with an optical beam; and
a mounting structure for attaching the optical element to an optical bench;
wherein the optical element is solid-phase welded to the mounting structure
and wherein the optical element comprises a Fabry-Perot tunable filter.
8. (original) A micro-optical component as claimed in claim 1, wherein the mounting structure is fabricated from a metal.

9. (original) A micro-optical component as claimed in claim 1, wherein the mounting structure is metal coated.
10. (original) A micro-optical component as claimed in claim 1, wherein the mounting structure is coated with a thermocompression bond metal.
11. (original) A micro-optical component as claimed in claim 10, wherein the bond metal comprises gold.
12. (original) A micro-optical component as claimed in claim 1, further comprising depositing bond metal bumps on the mounting structure.
13. (original) A micro-optical component as claimed in claim 1, further comprising depositing bond metal bumps on the optical element.
14. (currently amended) A micro-optical system, comprising:
 - an optical element, including a lens, for interacting with an optical beam;
 - a mounting structure, the optical element being solid-phase welded to the mounting structure; and
 - an optical bench, the mounting structure being solder bonded to the optical bench.
15. (original) A micro-optical system as claimed in claim 14, wherein the optical element is thermocompression bonded to the mounting structure.
16. (original) A micro-optical system as claimed in claim 14, wherein the optical element is thermosonically bonded to the mounting structure.
17. (original) A micro-optical system as claimed in claim 14, wherein the optical element is ultrasonically welded to the mounting structure.
18. (original) A micro-optical system as claimed in claim 14, wherein the optical element comprises a lens substrate.
19. (previously amended) A micro-optical system, comprising:

an optical element for interacting with an optical beam;
a mounting structure, the optical element being solid-phase welded to the mounting structure; and
an optical bench, the mounting structure being solder bonded to the optical bench, wherein the optical element comprises a microelectromechanical device.

20. (previously amended) A micro-optical system, comprising:
an optical element for interacting with an optical beam;
a mounting structure, the optical element being solid-phase welded to the mounting structure; and
an optical bench, the mounting structure being solder bonded to the optical bench, wherein the optical element comprises a Fabry-Perot tunable filter.
21. (original) A micro-optical system as claimed in claim 14, wherein the mounting structure is fabricated from a metal.
22. (original) A micro-optical system as claimed in claim 14, wherein the mounting structure is metal coated.
23. (original) A micro-optical system as claimed in claim 14, wherein the mounting structure is coated with a thermocompression bond metal.
24. (original) A micro-optical system as claimed in claim 23, wherein the bond metal comprises gold.
25. (original) A micro-optical system as claimed in claim 14, further comprising depositing bond metal bumps on the mounting structure.
26. (original) A micro-optical system as claimed in claim 14, further comprising depositing bond metal bumps on the optical element.
27. (withdrawn) A process for assembling an optical system, the process comprising:

solid-phase welding an optical element to a mounting structure; and then attaching the mounting structure to an optical bench.

28. (withdrawn) A process as claimed in claim 27, wherein the step of solid-phase welding the optical element to the mounting structure comprises thermocompression bonding the mounting structure and the optical element.

29. (withdrawn) A process as claimed in claim 27, wherein the step of solid-phase welding the optical element to the mounting structure comprises thermosonically bonding the mounting structure and the optical element.

30. (withdrawn) A process as claimed in claim 27, wherein the step of solid-phase welding the optical element to the mounting structure comprises ultrasonically bonding the mounting structure and the optical element.

31. (withdrawn) A process as claimed in claim 27, wherein the step of attaching the mounting structure to the optical bench comprises solder bonding the mounting structure to the optical bench.

32. (withdrawn) A process as claimed in claim 27, wherein the step of attaching the mounting structure to the optical bench comprises:

depositing solder material on solder mating surfaces of the mounting structure and the optical bench;

reflowing the solder material to join the mating surfaces.

33. (withdrawn) A process as claimed in claim 27, wherein the step of solid-phase welding the optical element to the mounting structure comprises coating weld mating surfaces of the optical element and the mounting structure with bond material.

34. (withdrawn) A process as claimed in claim 27, wherein the step of solid-phase welding the optical element to the mounting structure comprises coating weld mating surfaces of the optical element and the mounting structure with gold.

Evidence Appendix

None

Related Proceedings Appendix

None